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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,931	01/29/2004	Youichi Kukimoto	Q79041	1863

23373 7590 02/07/2006

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EXAMINER	
NGUYEN, KHIEM D	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/765,931	KUKIMOTO ET AL.	
	Examiner	Art Unit	
	Khiem D. Nguyen	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

New Grounds of Rejection

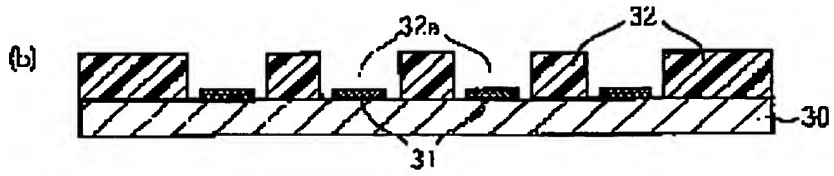
Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

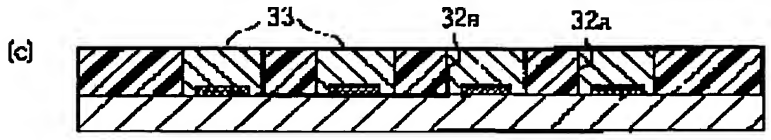
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama Seiki ("Method for forming bump", Japan Publication number 2002-334895, translation) in view of Masterton (U.S. Patent 5,738,269).

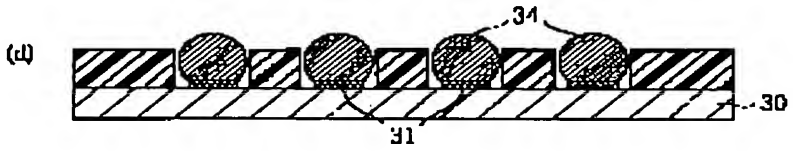
In re claim 1, **Sakuyama** discloses a solder deposition method comprising the steps of: forming a dam **32** so as to surround electrodes **31** on the surface of a substrate **30** having electrodes **31** in its surface provided with an opening part **32a** disposed in the electrodes **31** (Detailed Description, pages 1-2, paragraph [0006] and FIG. 3b);



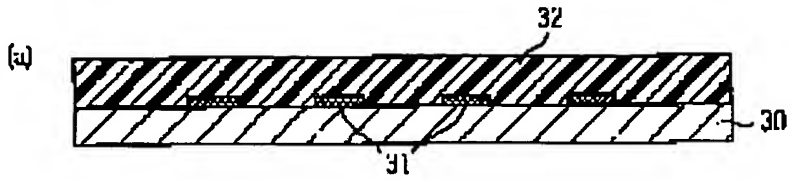
applying a solder precipitating composition **33** to the substrate **30** (FIG. 3c); and



depositing solder **34** on the surface of the electrode **31**while heating the solder precipitating composition **33** applied (page 2, paragraph [0006] and FIG. 3d).



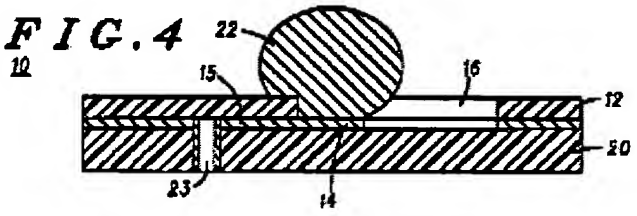
In re claim 2, **Sakuyama** discloses that the step of forming a dam includes the steps of: forming a resin film **32** on the surface of the substrate **30** (FIG. 3a); and



providing an opening part **32a** in said resin film **32** so that a dam is formed around an electrode **31** on a substrate **30** (pages 1-2, paragraph [0006]).

Sakuyama does not explicitly disclose that the electrodes covered with a solder resist film.

Masterton, however, discloses a solder deposition method comprising the step of covered the electrodes **14** with a solder resist **12** (col. 2, lines 43-66 and FIG. 4).



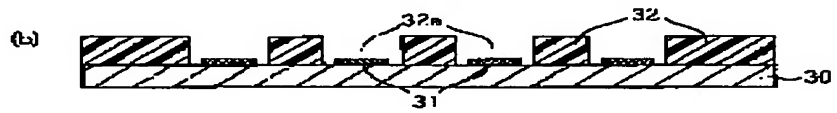
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sakuyama and Masterton to enable the process of covering the electrodes with a solder resist of Sakuyama to be

performed and furthermore to enhance the accurate positioning of solder bumps over solder pads and which increases the reliability of connections between solder bumps and solder pads (col. 1, lines 36-39, Masterton).

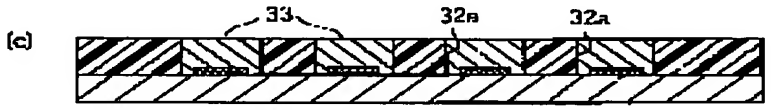
In re claim 3, **Sakuyama** discloses that the dam **32** is not removed after depositing solder **34** (FIG. 3d).

In re claim 4, **Sakuyama** discloses that the substrate is a via-on-pad structured substrate (pages 1-2, paragraph [0006] and FIGS. 3(a)-(e)).

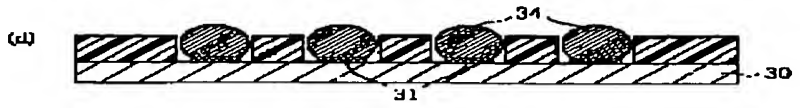
In re claim 7-9, **Skuyama** discloses a solder bump forming method comprising the steps of: forming a dam **32** so as to surround electrodes **31** on the surface of a substrate **30** having electrodes **31** in its surface that is provided with an opening part **32a** disposed in the electrodes (Detailed Description, pages 1-2, paragraph [0006] and FIG. 3b);



applying a solder precipitating composition **33** to the substrate **30** (FIG. 3c); and

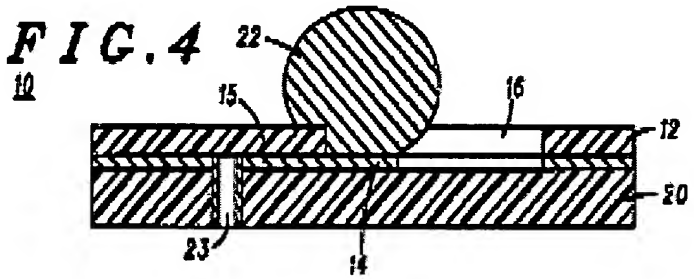


forming a solder bump **34** by depositing solder on the surface of the electrode **31** while heating the solder precipitating composition **33** applied (page 2, paragraph [0006] and FIG. 3d).



Sakuyama does not explicitly disclose that the electrodes covered with a solder resist film.

Masterton, however, discloses a solder deposition method comprising the step of covered the electrodes **14** with a solder resist **12** (col. 2, lines 43-66 and FIG. 4).



Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sakuyama and Masterton to enable the process of covering the electrodes with a solder resist of Sakuyama to be performed and furthermore to enhance the accurate positioning of solder bumps over solder pads and which increases the reliability of connections between solder bumps and solder pads (col. 1, lines 36-39, Masterton).

2. Claims 5-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama Seiki ("Method for forming bump", Japan Publication number 2002-334895, translation) in view of Masterton (U.S. Patent 5,738,269) as applied to claim 1 above, and further in view of Ikeda et al. (U.S. Patent 6,923,875).

In re claims 5-6 and 8-9, **Sakuyama** does not explicitly teach that the solder precipitating composition contains a tin powder; and a complex of at least one selected from the group consisting of silver ions and copper ions, and at least one selected from

the group consisting of aryl phosphines, alkyl phosphines and azoles as recited in the dependent claims 5 and 7, and that the solder precipitating composition contains a tin powder and a salt of at least one metal selected from the group consisting of lead, copper and silver as recited in dependent claims 6 and 8.

Ikeda, however, discloses that the solder precipitating composition contains tin a powder; and a complex of at least one selected from group consisting of silver ions and copper ions, and at least one selected from the group consisting of aryl phosphines, alkyl phosphines and azoles (col. 1, line 64 to col. 2, line 11),

> The solder precipitating composition of the present invention comprises a tin powder; and a complex of at least one selected from silver ions and copper ions and at least one selected from aryl phosphines, alkyl phosphines and azoles.

and that the solder precipitating composition contains a tin powder and a salt of at least one metal selected from the group consisting of lead, copper and silver (col. 1, lines 44-49).

> According to the principle of alloy formation by the above solder precipitating composition, it is also possible to obtain the lead-free solder with use of tin powder and a silver salt or a copper salt, where the substitution between a portion of tin particle and such organometallic salts gives lead-free alloys as described above.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sakuyama and Ikeda to enable the process of applying a solder precipitating composition contains tin powder and a complex of at least one selected from silver ions and copper ions, and at least one selected form aryl phosphines, alkyl phosphines and azoles of Takahashi to be performed and furthermore to provide a solder precipitation method in which solder precipitating

compositions would give proper lead-free solders on the lands of a circuit board (col. 2, lines 4-7, Ikeda).

Response to Applicants' Amendment and Arguments

Applicants' arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Applicants contend that the reference Sakuyama Seiki ("Method for forming bump", Japan Publication number 2002-334895, translation) herein known as Sakuyama does not disclose a solder resist film.

In response to Applicants' contention that Sakuyama does not disclose a solder resist film, Examiner respectfully submits that Applicants' argument is moot in view of the newly discovered reference to Masterton (U.S. Patent 5,738,269) applied under 35 U.S.C. 103(a) rejection presented in this Office Action. Applicants are directed to (col. 2, lines 43-66 and FIG. 4) where Masterton discloses a solder deposition method comprising the step of covered the electrodes **14** with a solder resist **12**.

For this reason, Examiner holds the rejection proper.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is

not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K.N.
February 3, 2006

W. DAVID COLEMAN
PRIMARY EXAMINER